

Intercepted armored scales (Hemiptera : Diaspididae) on imported plants at the ports of entry in the Republic of Korea

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Abstract: A total of 51 species of armored scale insects occurring in 13 different countries were intercepted by Korean quarantine officers on shipments of plants at the ports of entry in the Republic of Korea from 1996 to 2008. A key and photographs to help identify the 51 intercepted species of armored scales insects are provided.

Key words: Armored scales; taxonomic identification; quarantine; intercepted species; imported plants

About 2 400 species of armored scale insects (Diaspididae) are known worldwide (Miller and Davidson, 2005; Miller *et al.*, 2006). Many of them are of quarantine significance since they occur on a variety of host plants including woody and herbaceous plants and are often difficult to detect due to their small size (1 to 2 mm length of female). Korea imports large amounts of plants and their products from other countries or regions that may contain exotic armored scale insect pests. Therefore, it is imperative that intercepted species be detected and identified quickly and accurately to determine their potential threat and take the appropriate action. A key and photographs presented below will provide enough information to aid the Korea National Plant Quarantine Service (NPQS) identifiers to make determinations of intercepted specimens.

Based upon data from the Pest Information System (PIS) database (Table 1), a total of 51 species of armored scales from 13 different countries were intercepted on 235 shipments of plants (including cut flowers) coming into at the ports of

entry in the Republic of Korea between 1996 to 2008. The most commonly intercepted species were *Pseudaulacaspis pentagona* (Targioni-Tozzetti), *Pinnaspis aspidistrae* (Signoret), *Aulacaspis yasumatsui* Takagi, and *Chrysomphalus aonidum* (Linnaeus). The cycad aulacaspis scale, *A. yasumatsui* Takagi was intercepted 29 times at the ports of entry and is considered to be serious pest of cycads wherever they are found (Hodges *et al.*, 2005). Shipments originating in China mainland, one of major plant-importing countries, represented the highest number of interceptions.

This paper includes a key and photographs of 51 species of armored scales intercepted on plants imported into Korea. We were not able to examine specimens of some of the species listed in the interception records in the PIS database. The terminology for morphological structures used in this paper is that of Miller and Davidson (2005). Illustrative photographs were taken using iSolution DT and AxioVision Release 4.7 Software.

Table 1 Collection details of species of armored scales intercepted on imported plants

| Scientific name | Distribution in KO | INT | Shipment origin | | | | | | | | | | | | | |
|---------------------------------|-----------------------|-----|-----------------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | | JA | CH | TA | IN | MA | PH | SL | TH | VI | AU | NZ | CR | US | SA |
| <i>Abgrallaspis cyanophylli</i> | no | 1 | | | | | | | | | | | | 1 | | |
| <i>Aonidiella aurantii</i> | no | 2 | | | | | | | | 1 | | | | 1 | | |
| <i>Aonidiella orientalis</i> | no | 1 | | 1 | | | | | | | | | | | | |
| <i>Aspidiotus chinensis</i> | no | 3 | | 3 | | | | | | | | | | | | |
| <i>Aspidiotus destructor</i> | yes | 2 | | 1 | | | | 1 | | | | | | | | |
| <i>Aspidiotus nerii</i> | ? | 4 | | 2 | | | | 1 | | | | | 1 | | | |

Table 1 continued

| Scientific name | Distribution in KO | INT | Shipment origin | | | | | | | | | | | | | |
|--------------------------------------|-----------------------|-----|-----------------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | | JA | CH | TA | IN | MA | PH | SL | TH | VI | AU | NZ | CR | US | SA |
| <i>Aulacaspis crawii</i> | no | 1 | | 1 | | | | | | | | | | | | |
| <i>Aulacaspis neospinosa</i> | no | 2 | | 2 | | | | | | | | | | | | |
| <i>Aulacaspis spinosa</i> | yes | 1 | | 1 | | | | | | | | | | | | |
| <i>Aulacaspis tubercularis</i> | no | 1 | | | 1 | | | | | | | | | | | |
| <i>Aulacaspis yasumatsui</i> | no | 29 | | 6 | 21 | | 1 | | | | 1 | | | | | |
| <i>Carulaspis minima</i> | no | 1 | | | | | | | | | | | | | 1 | |
| <i>Chrysomphalus aonidum</i> | ? | 20 | | 4 | 3 | 2 | | 1 | | | | | | 10 | | |
| <i>Chrysomphalus bifasciculatus</i> | yes | 2 | 1 | | | | | | | | | | | | 1 | |
| <i>Chrysomphalus dictyospermi</i> | yes | 3 | | | 1 | | | | | | | | | | 2 | |
| <i>Chrysomphalus pinnulifer</i> | no | 1 | | | | | | | | | | | | | 1 | |
| <i>Diaspidiotus perniciosus</i> | yes | 1 | | 1 | | | | | | | | | | | | |
| <i>Diaspis boisduvalii</i> | ? | 2 | | | | | | | 1 | | | | | | 1 | |
| <i>Diaspis echinocacti</i> | ? | 2 | | 2 | | | | | | | | | | | | |
| <i>Froggattiella penicillata</i> | no | 1 | | 1 | | | | | | | | | | | | |
| <i>Hemiberlesia lataniae</i> | ? | 9 | | 2 | 1 | 2 | | | | | | 2 | 1 | 1 | | |
| <i>Hemiberlesia palmae</i> | no | 2 | | | | 1 | 1 | | | | | | | | | |
| <i>Hemiberlesia rapax</i> | no | 2 | | | | 1 | | 1 | | | | | | | | |
| <i>Howardia biclavus</i> | no | 4 | | | | 4 | | | | | | | | | | |
| <i>Lepidosaphes camelliae</i> | no | 1 | 1 | | | | | | | | | | | | | |
| <i>Lepidosaphes chinensis</i> | no | 4 | | 4 | | | | | | | | | | | | |
| <i>Lepidosaphes laterochitinosus</i> | no | 1 | | | | | | 1 | | | | | | | | |
| <i>Lepidosaphes pinnaeformis</i> | yes | 15 | | 11 | 4 | | | | | | | | | | | |
| <i>Lepidosaphes tokionis</i> | no | 1 | | | | | | | 1 | | | | | | | |
| <i>Lindingaspis rossi</i> | no | 3 | | | | | | | | | | 3 | | | | |
| <i>Lopholeucaspis japonica</i> | yes | 1 | 1 | | | | | | | | | | | | | |
| <i>Microparlatoria fici</i> | no | 2 | | | 1 | 1 | | | | | | | | | | |
| <i>Morganella longispina</i> | no | 1 | | 1 | | | | | | | | | | | | |
| <i>Odonaspis secreta</i> | yes | 1 | | | | | | | 1 | | | | | | | |
| <i>Parlatoreopsis chinensis</i> | no | 1 | | 1 | | | | | | | | | | | | |
| <i>Parlatoria pittospori</i> | no | 1 | | | | | | | | | | | | | | 1 |
| <i>Parlatoria proteus</i> | ? | 3 | | | 2 | 1 | | | | | | | | | | |
| <i>Parlatoria theae</i> | yes | 2 | 2 | | | | | | | | | | | | | |
| <i>Parlatoria ziziphi</i> | no | 1 | | | | | | | | 1 | | | | | | |
| <i>Pinnaspis aspidistrae</i> | yes | 30 | | 12 | 4 | | | | | | | | | | 14 | |
| <i>Pinnaspis buxi</i> | ? | 3 | | | | 1 | | | | | | | | | 2 | |
| <i>Pinnaspis strachani</i> | ? | 1 | | | | | | | | | | | | | 1 | |
| <i>Pseudaonidia paeoniae</i> | yes | 3 | 3 | | | | | | | | | | | | | |
| <i>Pseudaonidia trilobitiformis</i> | no | 3 | | 1 | 1 | | | | | 1 | | | | | | |
| <i>Pseudaulacaspis cockerelli</i> | yes | 18 | 1 | 3 | | 5 | 4 | | 1 | 1 | | 3 | | | | |
| <i>Pseudaulacaspis pentagona</i> | yes | 36 | 3 | 9 | | 21 | 2 | | | 1 | | | | | | |
| <i>Pseudaulacaspis prunicola</i> | yes | 1 | 1 | | | | | | | | | | | | | |
| <i>Pseudaulacaspis</i> sp. | no | 1 | | 1 | | | | | | | | | | | | |
| <i>Selenaspidus articulatus</i> | no | 2 | | 1 | | | | | | | 1 | | | | | |
| <i>Unachionaspis tenuis</i> | yes | 1 | 1 | | | | | | | | | | | | | |
| <i>Unaspis euonymi</i> | yes | 1 | 1 | | | | | | | | | | | | | |

INT: Number of interceptions. KO: the Republic of Korea; JA: Japan; CH: China mainland; TA: Taiwan of China; IN: Indonesia; MA: Malaysia; PH: Philippines; SL: Sri Lanka; TH: Thailand; VI: Vietnam; AU: Australia; NZ: New Zealand; CR: Costa Rica; US: the United States; SA: South Africa. ?: Unknown; Specimens not examined even though known as greenhouse species in Korea.

Key to species of armored scales intercepted on imported plants (slide mounted adult female)

- 1 Dorsum of pygidium with an areolate pattern 2
- 1b Dorsum of pygidium without an areolate pattern 3
- 2(1) Perivulvar pores arranged in 4 groups; second lobe protruding posteriorly beyond the median lobes; posterior spiracles without associated pores (on *Dracaena* and *Ficus*; from China including Taiwan and Thailand)
..... *Pseudaonidia trilobitiformis* (Green) (Plate IX: 99 – 101)
- 2b Perivulvar pores arranged in 2 groups; second lobe not protruding posteriorly beyond the median lobes; posterior spiracles with associated pores (on *Camellia* and *Rhododendron*; from Japan)
..... *Pseudaonidia paeoniae* (Cockerell) (Plate VIII: 96, Plate IX: 97 – 98)
- 3(1b) With at least 1 pore present near the posterior or anterior spiracles 4
- 3b Without pores near the spiracles 35
- 4(3) Pygidium with at least one pair of marginal scleroses indicating the intersegmental junctures of the abdominal segments 6 to 8; occurring on bamboo 5
- 4b Pygidium without intersegmental scleroses; not occurring on bamboo 6
- 5(4) Pygidium with at least one pair of short marginal scleroses; without an apical cluster of seta-like gland spines (on *Bambusa*; from Sri Lanka) *Odonaspis secreta* (Cockerell) (Plate VII: 75 – 76)
- 5b Pygidium with 2 pairs of long intersegmental scleroses; with an apical cluster of seta-like gland spines (on unidentified bamboo; from China mainland) *Froggatiella penicillata* (Green) (Plate IV: 40 – 41)
- 6(4b) With an elongate, club-shaped, internal, sclerotized process arising from the base of each median lobes (on *Plumeria*; from Indonesia) *Howardia biclavis* (Comstock) (Plate V: 49 – 52)
- 6b Without an elongate, club-shaped, internal, sclerotized process arising from the base of each median lobes 7
- 7(6b) Body elongate, oval, or turbinate, not as described below 12
- 7b Body elongate, head and/or anterior 2 thoracic segments rectangular in shape, wider than remainder of body 8
- 8(7b) Dorsal macroducts present on abdominal segment 1 9
- 8b Dorsal macroducts absent on abdominal segment 1 10
- 9(8) Abdominal segment 1 with double rows of submedial macroducts (on *Cymbidium*; from China mainland)
..... *Aulacaspis crawii* (Cockerell)
- 9b Abdominal segment 1 with a single row of submedial macroducts (on *Cymbidium*; from China mainland)
..... *Aulacaspis neospinosa* Tang (Plate II: 13 – 14)
- 10(8b) Dorsal macroducts present on abdominal segment 2 (on *Cymbidium*; from China mainland)
..... *Aulacaspis spinosa* (Maskell) (Plate II: 15 – 16)
- 10b Dorsal macroducts absent on abdominal segment 2 11
- 11(10) Mouthparts with sclerotized structures of an archer's bow on each side of labium; dorsal microducts absent in submedial areas of abdominal segments 1 and 2 (on *Mangifera*; from Taiwan of China)
..... *Aulacaspis tubercularis* Newstead (Plate II: 17 – 19)
- 11b Mouthparts without sclerotized structures of an archer's bow on each side of labium; dorsal microducts present in submedial areas of abdominal segments 1 and 2 (on *Cycas*; from China including Taiwan, Malaysia, and Vietnam) ...
..... *Aulacaspis yasumatsui* Takagi (Plate II: 20 – 22)
- 12(7) Pygidium with more than 7 groups of perivulvar pores, dorsum with sclerotized areas and a row of gland spines present from the prothorax to abdominal segment 4 (on *Rhododendron*; from Japan)
..... *Lopholeucaspis japonica* (Cockerell) (Plate VI: 67 – 70)
- 12b Without the above combination of character states 13
- 13(12b) Median lobes present, yoked basally by an internal sclerosis 14
- 13b Median lobes present or absent; if present, then not yoked basally by an internal sclerosis 20
- 14(13) Median lobes very tightly appressed although having a small space between them 15
- 14b Median lobes distinctly separated 17
- 15(14) Without macroducts on submarginal areas of abdominal segment 5; preanal sclerosis lacking (on *Cordyline*; from Indonesia and Costa Rica) *Pinnaspis buxi* (Bouche) (Plate VIII: 91 – 93)
- 15b With macroducts on submarginal areas of abdominal segment 5; preanal sclerosis lacking or distinct 16
- 16(15b) Preanal sclerosis lacking or represented only by faint sclerotized patches; median lobes protrude less than, or about same distance, as second lobes (on *Cymbidium*, *Dracaena*, and *Oncidium*; from China including Taiwan, and Costa Rica) *Pinnaspis aspidistrae* (Signoret) (Plate VIII: 89 – 90)
- 16b Preanal sclerosis represented by a pronounced sclerotized bar; median lobes protrude beyond, or about same distance, as second lobes (on *Dracaena*; from Costa Rica) *Pinnaspis strachani* (Cooley) (Plate VIII: 94 – 95)
- 17(14b) Body elongate, length greater than 2 times maximum width 18
- 17b Body turbinate, length less than 2 times maximum width 19
- 18(17) With macroducts on abdominal segment 6 (on *Areca*, *Berzelia*, *Caryota*, *Cymbidium*, *Ficus*, *Mangifera*, and unidentified cut flower; from Japan, China mainland, Indonesia, Malaysia, Sri Lanka, Thailand, and Australia)
..... *Pseudaulacaspis cockerelli* (Cooley) (Plate IX: 102 – 104)
- 18b Without macroducts on abdominal segment 6 (on *Cymbidium*; from China mainland)
..... *Pseudaulacaspis* sp. (Plate X: 109 – 110)
- 19(17b) Third space usually with 1 gland spine; at least 1 bifurcate or trifurcate gland spine in second, third, or fourth

- spaces (on *Actinidia*, *Croton*, *Dracaena*, *Juglans*, *Lantana*, *Plumeria*, *Polyscias*, *Prunus*, *Schefflera*, *Sophora*, and unidentified plant and cut flower; from Japan, China mainland, Indonesia, Malaysia, and Thailand) ***Pseudaulacaspis pentagona* (Targioni Tozzetti)** (Plate IX: 105–108)
- 19b Third space usually with 2 or more gland spine; gland spines rarely with bifurcate or trifurcate apex (on *Prunus*; from Japan) ***Pseudaulacaspis prunicola* (Maskell)**
- 20(13b) Median, 2nd and 3rd pygidial lobes very small and pointed; the margins of thorax swollen; occurring on bamboo (on unidentified bamboo; from Japan) ***Unachionaspis tenuis* (Maskell)** (Plate X: 113–114)
- 20b Median, 2nd and 3rd pygidial lobes not as above combination of character states 21
- 21(20b) Second lobes bilobate (with 2 lobules) 22
- 21b Second lobes simple (with 1 lobule) 30
- 22(21) Body elongate, length greater than 2 times maximum width 23
- 22b Body turbinate, length less than 2 times maximum width 28
- 23(22) Pygidium with three pairs of pygidial lobes; 3rd lobes distinct (on *Euonymus*; from Japan) ***Unaspis euonymi* (Comstock)** (Plate X: 115–117)
- 23b Pygidium with two pairs of lobes; if 3rd lobes present, then small pointed 24
- 24(23b) Cicatrices, pigmented or membranous, present on abdominal segments 1 to 6 (on *Cymbidium*, *Dracaena*, *Rhaphis*; from China mainland) ***Lepidosaphes chinensis* Chamberlin** (Plate V: 55–57)
- 24b Cicatrices absent on abdominal segments 25
- 25(24b) Head lightly sclerotized, expanded laterally to form lobes or projections (on *Codiaeum*; from Sri Lanka) ***Lepidosaphes tokionis* (Kuwana)** (Plate VI: 63–64)
- 25b Head membranous, rounded, not expanded laterally 26
- 26(25b) Eyes spur-like, modified and projecting near the body margin (on *Cymbidium*; from China including Taiwan) ***Lepidosaphes pinnaeformis* (Bouche)** (Plate VI: 61–62)
- 26b Eyes not spur-like and projecting near the body margin 27
- 27(26b) Dorsal submarginal macroducts present on segment 7, distinctly smaller than other dorsal pygidial macroducts; cuticle of head with numerous tiny spines; on many hosts (on *Dracaena*; from Philippines) ***Lepidosaphes laterochitinsa* Green** (Plate V: 58–60)
- 27b Dorsal submarginal macroducts absent on segment 7; cuticle of head without numerous tiny spines; common on camellias (on *Camellia*; from Japan) ***Lepidosaphes camelliae* Hoke** (Plate V: 53–54)
- 28(22b) Pygidium with macroducts absent between the median lobes (on *Juniperus*; from US) ***Carulaspis minima* (Signoret)** (Plate II: 23–24)
- 28b Pygidium with barrel-shaped macroducts present between the median lobes 29
- 29(28b) Pygidium without submedial macroducts on segments 2 to 5; median lobes with notches present on the medial margin (on *Ananas* and *Dracaena*; from Sri Lanka and Costa Rica) ***Diaspis boisduvalii* Signoret** (Plate III: 34–36)
- 29b Pygidium with submedial macroducts on segments 2 to 5; median lobes without notches on medial margin; primarily on cactus (on *Gymnocalycium* and unidentified cactus; from China mainland) ***Diaspis echinocacti* (Bouche)** (Plate IV: 37–39)
- 30(21b) Space between median and second pygidial lobes with a globular sclerosis; median lobes longer than 2nd lobes and with 3–4 lateral notches (on *Sophora*; from China mainland) ***Parlatoresopsis chinensis* (Marlatt)** (Plate VII: 77–79)
- 30b Space between median and second pygidial lobes without a globular sclerosis; median lobes about same size as, or smaller than 2nd lobes, and with 1–2 lateral notches 31
- 31(30b) Without marginal macroducts present between the median lobes; with 3–4 large marginal macroducts on each side of the pygidium (on *Ficus*; from Taiwan of China and Indonesia) ***Microparlatoria fici* (Takahashi)** (Plate VI: 71–72)
- 31b With marginal macroducts present between median lobes; with more than 6 large marginal macroducts on each side of the pygidium 32
- 32(31b) Dermal pockets absent between posterior spiracle and body margin 33
- 32b Dermal pockets present between posterior spiracle and body margin 34
- 33(32) With conspicuous ear-like lobes on body margin laterad of the mouthparts; macroducts not present on submedian areas of abdominal segments 4 and 5 (on *Citrus*; from Thailand) ***Parlatoria ziziphi* (Lucas)** (Plate VIII: 87–88)
- 33b Without conspicuous ear-like lobes on body margin laterad of the mouthparts; macroducts present on submedian areas of abdominal segments 4 and 5 (on *Paranomus*; from South Africa) ***Parlatoria pittospori* Maskell** (Plate VII: 80–81)
- 34(32b) Eye spurlike, apically pointed (on *Dracaena*; from Taiwan of China and Indonesia) ***Parlatoria proteus* (Curtis)** (Plate VII: 82–84)
- 34b Eye variable, usually low dome shaped (on *Ilex*; from Japan) ***Parlatoria theae* Cockerell** (Plate VIII: 85–86)
- 35(3b) Median lobes with basal sclerosis 48
- 35b Median lobes without basal sclerosis 36
- 36(35b) Body with a distinct indentation between the mesothorax and metathorax; sclerotized spur present at indentation of meso and metathorax (on *Coffea* and *Ficus*; from China mainland and Vietnam) ***Selenaspidus articulatus* (Morgan)** (Plate X: 111–112)

- 36b Body without an indentation between the mesothorax and metathorax; sclerotized spur absent at indentation of meso and metathorax 37
- 37(36b) With perivulvar pores 40
- 37b Without perivulvar pores 38
- 38(37b) With 2 conspicuous scleroses associated with apophysis anterolaterad of the vulva (on *Dracaena* and *Nerium*; from Costa Rica and Thailand) *Aonidiella aurantii* (Maskell) (Plate I : 3–4)
- 38b Without scleroses associated with apophysis 39
- 39(38b) Base of pygidium with a macroduct present between the median lobes; plates anterior of 3rd lobes distinctive, apices with 1 or 2 lateral tines and with a central microduct (on *Juglans*; from China mainland) *Diaspidiotus perniciosus* (Comstock) (Plate III : 32–33)
- 39b Base of pygidium without a macroduct present between median lobes; plates anterior of 3rd lobes simple without tines and associated microducts (on *Schefflera* and unidentified palm; from Indonesia and Philippines) *Hemiberlesia rapax* (Comstock) (Plate IV : 47–48)
- 40(37) Paraphyses conspicuous, most as long as or longer than the length of the median lobes 41
- 40b Paraphyses absent or inconspicuous, all paraphyses shorter than median lobes 45
- 41(40) With at least 1 cluster of macroducts on submarginal areas of prepygidial segments 42
- 41b Without a cluster of macroducts on submarginal areas of prepygidial segments 43
- 42(41) With a cluster of macroducts on submarginal areas of abdominal segment 2 (on *Cymbidium*, *Dracaena*, *Ficus*, and *Rhapis*; from China including Taiwan, Indonesia, Philippines, and Costa Rica) *Chrysomphalus aonidum* (Linnaeus) (Plate III : 25–26)
- 42b With a cluster of macroducts on submarginal areas of abdominal segments 2 and 3 (on *Dracaena* and *Euonymus*; from Japan and Costa Rica) *Chrysomphalus bifasciculatus* Ferris (Plate III : 27–29)
- 43(41b) Pygidium without a row of small paraphyses on the 4th lobe 44
- 43b Pygidium with a row of small paraphyses on the 4th lobe (on *Leucadendron* and unidentified cut flower; from Australia) *Lindingaspis rossi* (Maskell) (Plate VI : 65–66)
- 44(43) Pygidium with a single furrow on the 2nd and 3rd spaces (on *Cymbidium* and *Dracaena*; from Taiwan of China, and Costa Rica) *Chrysomphalus dictyospermi* (Morgan) (Plate III : 30–31)
- 44b Pygidium with 2 to 3 rows of furrows on the 2nd and 3rd spaces (on *Dracaena*; from Costa Rica) *Chrysomphalus pinnulifer* (Maskell)
- 45(40b) Plates between pygidial lobes 3 and 4 with sickle-shape apices; pygidium with a row of macroducts on submarginal areas of abdominal segments 1 to 3 (on unidentified palm; from China mainland) *Aonidiella orientalis* (Newstead) (Plate I : 5–6)
- 45b Plates between pygidial lobes 3 and 4 without sickle-shape apices; pygidium without a row of macroducts on submarginal areas of abdominal segments 1 to 3 46
- 46(45b) Pygidium with fringed or branched plates anterior of lobe 3 47
- 46b Pygidium with simple plates anterior of lobe 3 (on *Alocasia*, *Cycas*, *Cymbidium*, *Dracaena*, and unidentified plant and cut flower; from China including Taiwan, Indonesia, Australia, New Zealand, and Costa Rica) *Hemiberlesia lataniae* (Signoret) (Plate IV : 42–44)
- 47 Pygidium with the 2nd lobe sclerotized, space between the base of median lobes and posterior of anus longer than diameter of anus (on *Dracaena*; from Costa Rica) *Abgallaspis cyanophylli* (Signoret) (Plate I : 1–2)
- 47b Pygidium with the 2nd lobe unsclerotized, space between the base of median lobes and posterior of anus shorter than diameter of anus (on *Areca* and *Ficus*; from Indonesia and Malaysia) *Hemiberlesia palmae* (Cockerell) (Plate IV : 45–46)
- 48(35) 2nd and 3rd lobes absent; highly branched plates exceeding length of median lobes (on *Lagerstroemia*; from China mainland) *Morganella longispina* (Morgan) (Plate VII : 73–74)
- 48b 2nd and 3rd lobes present 49
- 49(48b) With macroducts on prepygidial segments; second lobes not protruding beyond median lobes 50
- 49b Without macroducts on prepygidial segments; second lobes normally protruding beyond median lobes (on *Rhapis* and undetermined palm; from China mainland and Philippines) *Aspidiotus destructor* Signoret (Plate I : 9–10)
- 50(49) Marginal macroducts on pygidium short, length less than 3 times width of orifice (on *Cymbidium* and unidentified palm and cut flower; from China mainland, Philippines, and Australia) *Aspidiotus nerii* Bouche (Plate I : 11–12)
- 50b Marginal macroducts on pygidium long, length greater than 3 times width of orifice (on *Cymbidium*; from China mainland) *Aspidiotus chinensis* Kuwana & Muramatsu (Plate I : 7–8)

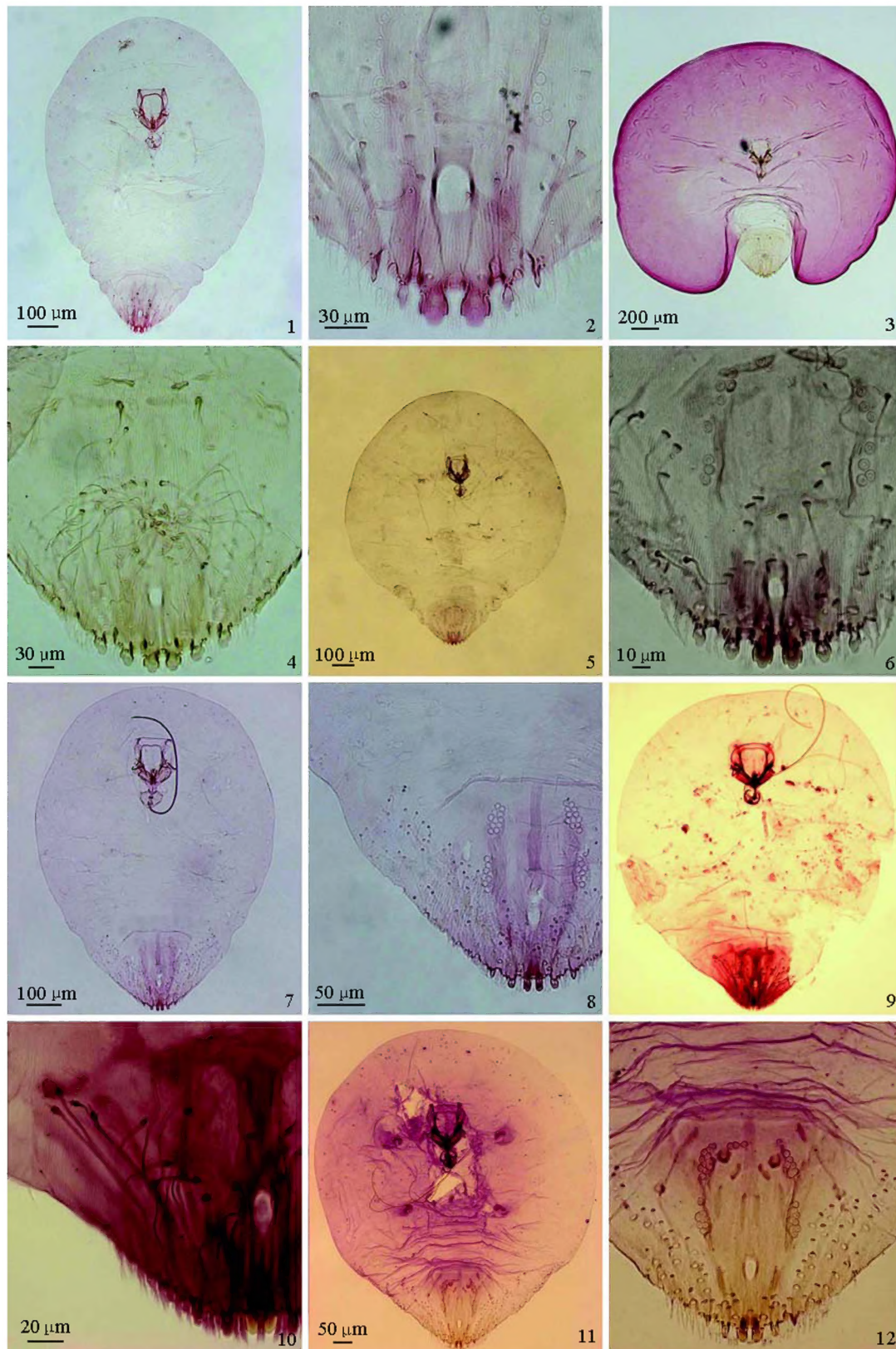
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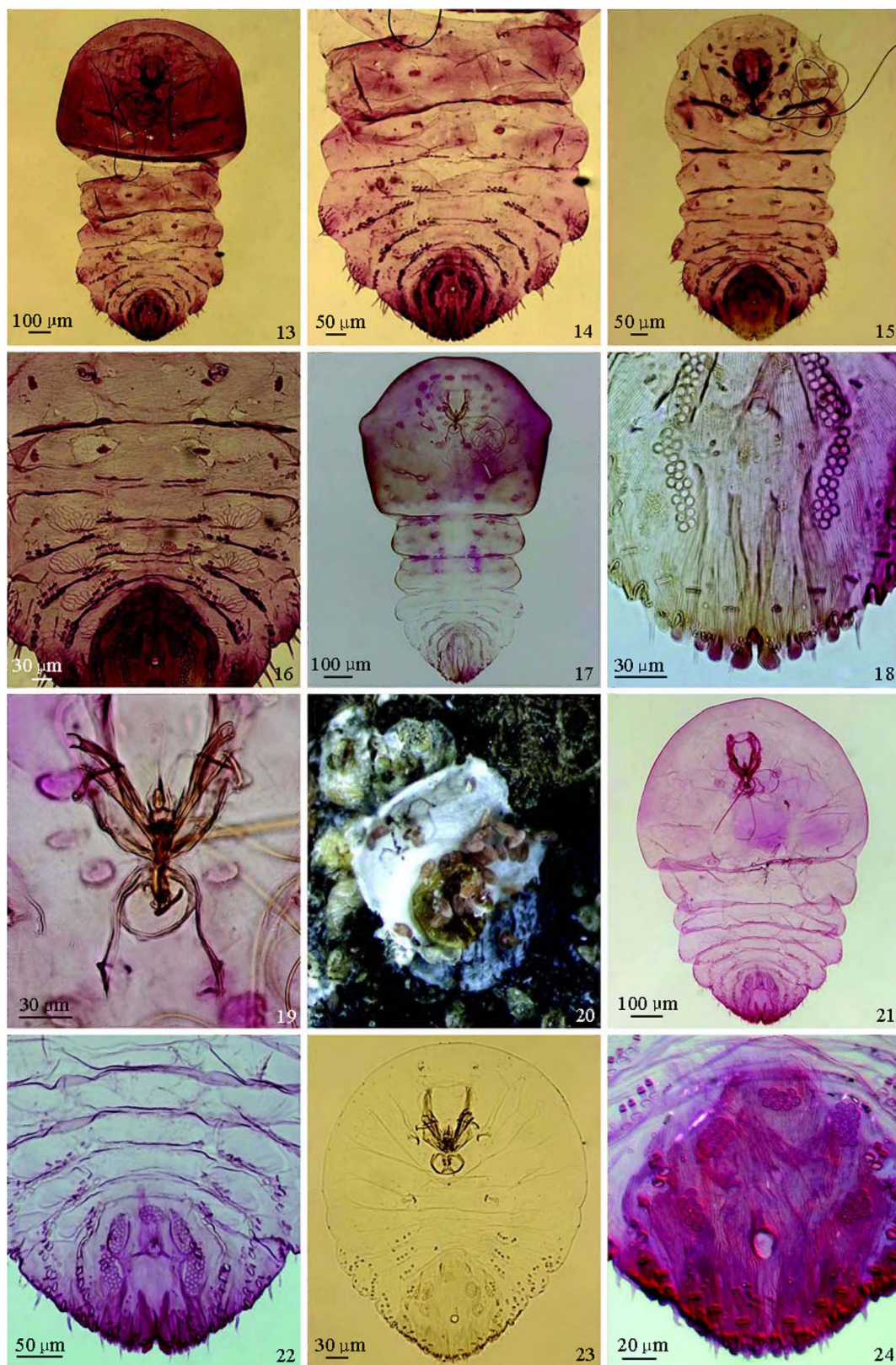
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Soo-Jung SUH *et al.*: Intercepted armored scales (Hemiptera: Diaspididae) on imported plants at the ports of entry in the Republic of Korea Plate I



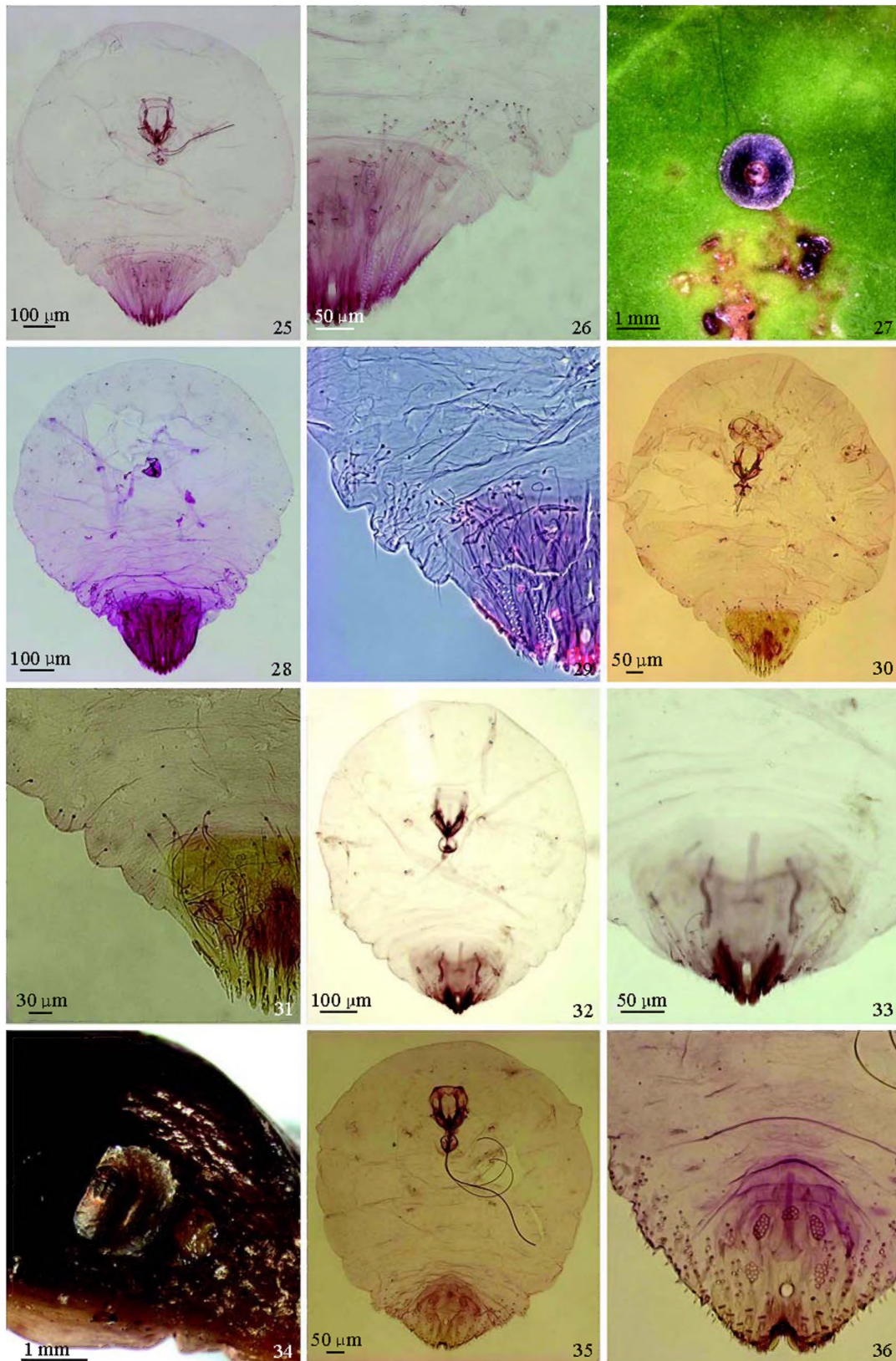
1 - 2. *Abgrallaspis cyanophylli*, Costa Rica, on *Dracaena*; 3 - 4. *Aonidiella aurantii*, Costa Rica, on *Dracaena*; 5 - 6. *Aonidiella orientalis*, China mainland, on unidentified palm; 7 - 8. *Aspidiotus chinensis*, China mainland, on *Cymbidium*; 9 - 10. *Aspidiotus destructor*, China mainland, on *Rhapis*; 11 - 12. *Aspidiotus nerii*, Philippines, on unidentified palm.

Soo-Jung SUH *et al.*: Intercepted armored scales (Hemiptera: Diaspididae) on imported plants at the ports of entry in the Republic of Korea Plate II



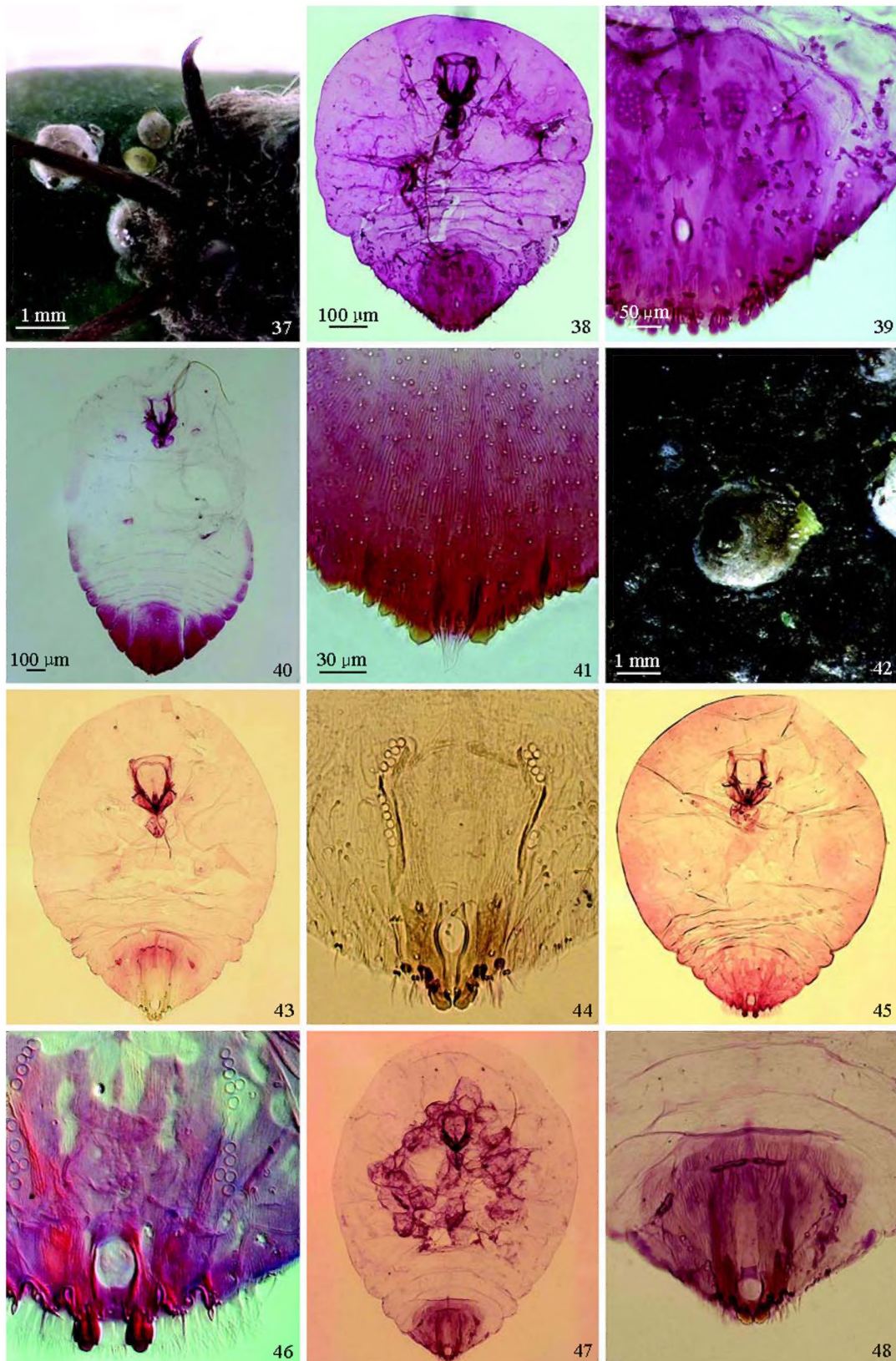
13 – 14. *Aulacaspis neospinosa*, China mainland, on *Cymbidium*; 15 – 16. *Aulacaspis spinosa*, China mainland, on *Cymbidium*; 17 – 19. *Aulacaspis tubercularis*, Taiwan of China, on *Mangifera*; 20 – 22. *Aulacaspis yasumatsui*, Taiwan of China, on *Cycas*; 23 – 24. *Carulaspis minima*, US, on *Juniperus*.

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25 – 26. *Chrysomphalus aonidum*, Indonesia, on *Dracaena*; 27 – 29. *Chrysomphalus bifasciculatus*, Japan, on *Euonymus*; 30 – 31. *Chrysomphalus dictyospermi*, Costa Rica, on *Dracaena*; 32 – 33. *Diaspidiotus perniciosus*, China mainland, on *Juglans*; 34 – 36. *Diaspis boisduvalii*, Sri Lanka, on *Ananas*.

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37 – 39. *Diaspis echinocacti*, China mainland, on unidentified cactus; 40 – 41. *Froggattiella penicillata*, China mainland, on unidentified bamboo; 42 – 44. *Hemiberlesia lataniae*, China mainland, on *Alocasia*; 45 – 46. *Hemiberlesia palmae*, Indonesia, on *Ficus*; 47 – 48. *Hemiberlesia rapax*, Philippines, on unidentified palm.

Soo-Jung SUH *et al.*: Intercepted armored scales (Hemiptera: Diaspididae) on imported plants at the ports of entry in the Republic of Korea Plate V



49 – 52. *Howardia biclavis*, Indonesia, on *Plumeria*; 53 – 54. *Lepidosaphes camelliae*, Japan, on *Camellia*; 55 – 57. *Lepidosaphes chinensis*, China mainland, on *Rhapis*; 58 – 60. *Lepidosaphes laterochitinos*a, Philippines, on *Dracaena*.

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61 – 62. *Lepidosaphes pinnaeformis*, China mainland, on *Cymbidium*; 63 – 64. *Lepidosaphes tokionis*, Sri Lanka, on *Codiaeum*; 65 – 66. *Lindingaspis rossi*, Australia, on *Leucadendron*; 67 – 70. *Lopholeucaspis japonica*, Japan, on *Rhododendron* (#70. 2nd instar); 71 – 72. *Microparlatoria fici*, Indonesia, on *Ficus*.

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73 – 74. *Morganella longispina*, China mainland, on *Lagerstroemia*; 75 – 76. *Odonaspis secreta*, Sri Lanka, on *Bambusa* (#76. 2nd instar male); 77 – 79. *Parlatoreopsis chinensis*, China mainland, on *Sophora*; 80 – 81. *Parlatoria pittospori*, South Africa, on *Paranomus*; 82 – 84. *Parlatoria proteus*, Taiwan of China, on *Dracaena*.

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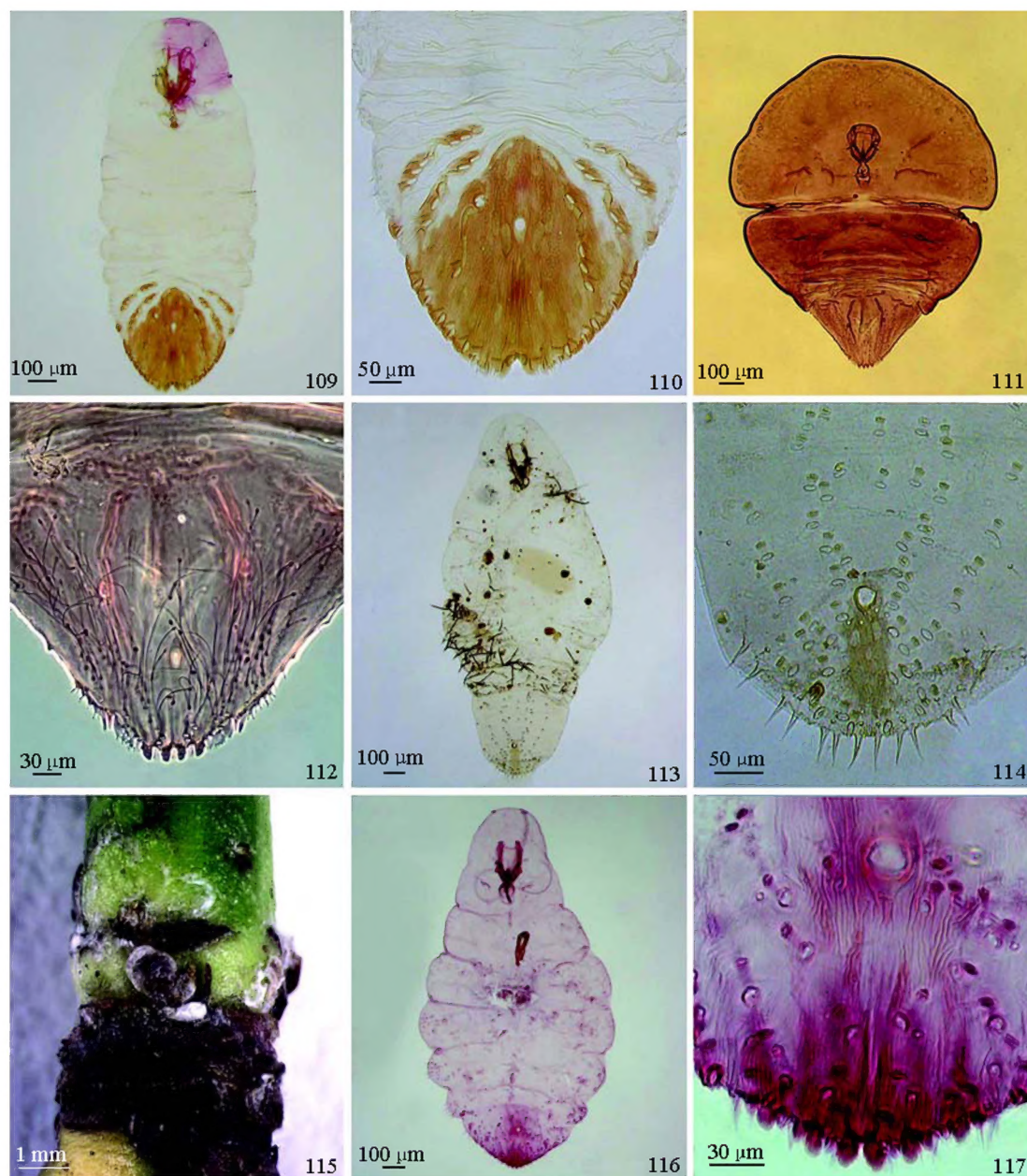
85 – 86. *Parlatoria theae*, Japan, on *Ilex*; 87 – 88. *Parlatoria ziziphi*, Thailand, on *Citrus*; 89 – 90. *Pinnaspis aspidistrae*, Costa Rica, on *Dracaena*; 91 – 93. *Pinnaspis buxi*, Indonesia, on *Cordyline*; 94 – 95. *Pinnaspis strachani*, Costa Rica, on *Dracaena*; 96. *Pseudaonidia paeoniae*, Japan, on *Camellia*.

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97 – 98. *Pseudaonidia paeoniae*, Japan, on *Camellia*; 99 – 101. *Pseudaonidia trilobitiformis*, Taiwan of China, on *Ficus*; 102 – 104. *Pseudaulacaspis cockerelli*, Indonesia, on *Ficus*; 105. *Pseudaulacaspis pentagona*, Indonesia, on *Lantana*; 106 – 108. *Pseudaulacaspis pentagona*, China mainland, on *Juglans*.

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109 – 110. *Pseudaulacaspis* sp., China mainland, on *Cymbidium*; 111 – 112. *Selenaspidus articulatus*, China mainland, on *Ficus*; 113 – 114. *Unachionaspis tenuis*, Japan, on unidentified bamboo; 115 – 117. *Unaspis euonymi*, Japan, on *Euonymus*.

韩国入境口岸进口植物上截获的盾蚧 (半翅目:盾蚧总科)

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摘要: 1996–2008 年在韩国入境口岸进口植物上截获了发生于 13 个国家的盾蚧类昆虫总共 51 种。本文提供了这些种类的检索表及照片,可供分类鉴定参考。

关键词: 盾蚧; 分类鉴定; 检疫; 截获物种; 进口植物; 韩国

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